United States Department of Agriculture | Forest Service | Northeastern Area State and Private Forestry | 271 Mast Road P. O. Box 640 Durham. NH 03824

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Chris Casey
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Dear Chris:

Enclosed is our evaluation of the sugarbush special use areas. You can pass the information around to other folks over there who may have an interest. If you have any questions about the evaluation or other forest health needs, give me a call at (603) 868-7718.

Sincerely,

KURT K. ALLEN
Entomologist
Forest Health Protection

Enclosure

cc:
R. Burt, GMNF-SO

UNITED STATES
DEPARTMENT OF
AGRICULTURE

Forest Service

Northeastern Area

Evaluation of Sugarbush Health in Special Use Areas on the Green Mountain National Forest

Biological Evaluation

November 1995

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INTRODUCTION

The Green Mountain National Forest provides a wide range of uses of its resources to the public. One is allowing individuals to use forest resources for their gain under special use permits. An example is using trees on National Forest land as sugarbushes. In this case, the permitee taps sugar maple trees located on the forest for production of maple syrup. There are currently 8 active and 1 prospective sugarbush special use permits on the Green Mountain National Forest. There is also 1 prospective permit that is located along the Appalachian Trail area by Hartford, VT.

To check on the overall condition of special use sugarbushes on the National Forest, a monitoring system was set up in each sugarbush in 1995. The system is designed to look at the current health of trees in the permit area and to monitor these areas in the future.

METHODS

Plots were installed and measured in 8 of the 9 areas on the Forest during the week of August 7, 1995. The ninth area was measured on September 6, 1995. The proposed area along the Appalachian Trail was not assessed this year.

In each area, 3 permanent plots were set up. Each plot was 20m by 20m. All trees greater than 5 inches in diameter were located and diameter at breast height recorded. Sugar maple in the plots were rated for overall vigor, trunk and bole defects, crown condition, and number of open tapholes.

The overall vigor rating considered the condition of the entire tree, including the crown, bole, and general appearance of the tree. Vigor was rated on a scale of 1 to 5, with 1 being the best health and 5 the worst. Vigor ratings of 1 or 2 are considered healthy.

The trunk and bole of each sugar maple was inspected for defects. Defects included large and small open wounds, closed wounds, cracks, swelling, and dead branches or stubs.

Crown ratings were taken for all sugar maples. These ratings consist of dieback, transparency, and defoliation. Dieback is the percent of the crown that is missing based on recently dead small branches and twigs. It is measured in 10% categories. Dieback is considered normal at 10% or less. Transparency is the amount of skylight visible through the foliated portions of branches and is averaged for the crown as a whole. In other words, the lower the transparency, the denser the foliage. We considered a rating of 20% or less to be normal. Defoliation is coded in 4 classes, 0-3, with 0 being no noticeable defoliation, 1 being less than 30% defoliation, 2 being 31 to 60% defoliation, and 3 being more than 60% defoliation.

The diameter of each tree and number of current tapholes were recorded to look at possible overtapping. The current recommendations are that trees from 10 to 12 inches DBH should have one current taphole, and trees that are from 12 to 18 inches DBH should have no more than two current taps.

RESULTS

Table 1 lists the mean dieback and mean transparency estimates for each sugarbush. The means were calculated using the dominant and codominant sugar maples in each area.

Table 1. Mean dieback and mean transparency ratings, by site.

Site	Mean dieback	Mean transparency
1-Lafeyette	7%	21%
2-DiPentima	8%	17%
3-Masterson	13%	19%
4-Forbes	5%	21%
5-Gale	5%	14%
5a-Orvis	3%	18%
6-Begin	10%	13%
7-Maxwell	8%	18%
9-Mt. Tabor	2%	16%

What follows are a set of brief summaries on each stand. They include comments about the stand in general, the health of each stand, and some recommendations on the future of the stand.

Site 1-Lafeyette

General: The stand had mostly small, pole-sized maple. Many of the stems were in the 10 to 12 inch DBH range and are straight.

Health: 94% of the sugar maple were in vigor class 1 or 2 and considered healthy. There were no significant trunk or bole defects. 88% of the stems had 10% or less dieback. 81% had 20% or less transparency ratings. There were no signs of noticeable defoliation. 10-12 inch DBH trees had one current tap.

Recommendations: At this time, the stand is in good health. There is a chance for this stand to be a good timber producer in the future. If that is desired, it may be important to keep a portion of the pole-sized sugar maple present free of taps. Trees that have been tapped can continue to be tapped.

Site 2-DiPentima

General: This stand appears to have been tapped recently, in the last 2 or 3 years. The stand is comprised of trees left after a partial cut. Most of the sugar maple are larger size, and there is very little advanced regeneration.

Health: 92% of the stems inspected were in vigor class 1 or 2 and considered healthy. There were no significant trunk or bole defects. 85% had 10% or less dieback and 100% had 20% or less transparency. No noticeable defoliation was detected. Tapping was at a good level, as most trees were greater than 12 inches DBH and had one current tap.
Recommendations: The stand is in good health. Tapping can continue at the current level.

Site 3-Masterson
General: This stand had mostly large diameter sugar maple. Most of the understory consisted of striped maple and ferns, with little regeneration of other species.
Health: This stand had more variability in crown conditions than the others. Generally, there were higher amounts of dieback in this stand. 84% of the stems had vigor ratings of 1 or 2. There were no significant trunk or bole defects. 74% of the trees had 10% or less dieback and 79% had 20% or less transparency. There was no noticeable defoliation. Tapping was at a fairly safe level, although there was occasionally a 11 or 12 inch tree with two current taps, but no major problems. The main problem was that taps had been left in the holes.
Recommendations: Tapping is probably the best use for this stand. It is on a steep hillside and much of the sugar maple is very large in size. It wouldn't hurt to cut back on the number of taps being put in, especially on the smaller trees. The taps should be removed once sap collection is complete for the year to speed the process of healing the taphole.

Site 4-Forbes
General: This stand had a well developed overstory of large, straight sugar maple with some large ash mixed in. There was a thick layer of sugar maple seedlings. This stand could have some timber value in the future, if desired.
Health: 100% of the stems had vigor ratings of 1 or 2. There were no significant trunk or bole defects. All the stems inspected had 10% or less dieback, 75% had 20% or less transparency. There was noticeable defoliation by the bruce spanworm throughout the stand, which is the reason transparency figures were somewhat high. Standwide, defoliation was light, about 25-30%. Tapping is at an acceptable level, only the largest stems (20 inches DBH +) had more than one current tap.
Recommendations: The tapping operation is well run. There are opportunities in this stand for some timber management. If that option is desired, then it may be appropriate to leave a percentage of the trees untapped.

Site 5-Gale
General: This stand is not currently tapped. It consists of mostly pole-sized trees and had been thinned 5-10 years ago. Sugar maple dominates the overstory and understory.
Health: All stems inspected were in vigor classes 1 or 2. 28% of the stems had large, open wounds on the trunk or bole. These are likely the result of the fairly recent thinning. All stems had 10% or less dieback and 20% or less transparency. There was no noticeable defoliation.
Recommendations: Most of the trees are borderline in size for tapping (large numbers were in the 6-12 inch range). There are scattered larger diameter stems; it is assumed that these are the ones being considered for tapping. Since the stand was thinnned (or partially cut) previously, it may be that timber production is also desired. If this is the case, then the amount of tapping should be monitored closely.

Site 5a-Orvis
General: This stand was dominated by sugar maple. There were many large (30 + inches DBH) old trees. There was also good sugar maple advanced regeneration and sugar maple seedlings covering the forest floor.
Health: All stems inspected were in vigor classes 1 or 2. 29% of the stems had large open wounds on the trunk or bole. All stems had 10% or less dieback and 94% had 20% or less transparency. There was no noticeable defoliation. There were concerns about tapping trees in smaller size classes. There were a number of 8 and 9 inch DBH trees being tapped, some with more than one current tap. Also, the taps had been left in the holes.
Recommendations: Continued tapping of the large overstory trees is probably the best use for them. There are timber possibilities in the future for the pole sized sugar maple. If this is a consideration, then tapping should be limited in these trees. The taps should be removed from the holes once sap collection is complete to help speed taphole closure.

Site 6-Begin
General: The trees being tapped in this plot consisted of large, old, fencerow trees. There was no sugar maple regeneration.
Health: 71% of the trees were in vigor classes 1 or 2. 29% had dead branches or stubs on the trunk or bole. 79% had 10% or less dieback and all had 20% or less transparency. These stems had generally higher amounts of dieback than the other stands examined. There was no noticeable defoliation. The level of tapping was appropriate, as many of the trees were very large diameter.
Recommendations: Our initial impression in looking at these trees was "what else would you do with these trees?" As long as the permittee is happy with the results, tapping should continue; it shouldn't cause any additional damage to the trees.

Site 7-Maxwell
General: The maple in the stand is large and old. The stand is converting to conifers, with most of the mid-story being spruce and hemlock. Roughly 25-30% of the stand is maple, the rest is spruce/hemlock, with very little maple regeneration.
Health: 94% of the maple stems were in vigor class 1 or 2. 25% of the stems had seams or cracks, 44% have closed wounds, 31% have swelling, and 25% have large open wounds. The maple left in the overstory have significant defects on the trunk and bole. There was also some evidence of *Armillaria* in the stand. 88% of the stems had 10% or less dieback, and 94% had 20% or less transparency. There was no noticeable defoliation. Tapping is at an acceptable level. Most of the maple are large diameter and 2 or 3 current taps are appropriate.
Recommendations: The stand is converting to softwoods, and the maple that is left has no real timber value. Our impression is that tapping will not cause any further damage to the maple.

Site 9-Mt. Tabor
General: Probably the nicest looking stand we were in. Large maple and beech, tall and straight. Could be a great timber producing stand if that was desired.
Health: All stems were in vigor classes 1 or 2. There were no significant trunk or bole defects. All the maple examined had 10% or less dieback and 20% or less transparency. There was no

noticeable defoliation. Tapping was at an acceptable level, 1 or 2 current taps in large diameter trees.

Recommendations: This stand has great timber possibilities. If this is desired, then minimizing tapping may be appropriate. The trees are in extremely good health, and the tapping that is currently taking place should not cause them to decline.

DISCUSSION

Overall, the stands that are being tapped were in good health this year. Sugarbushes in Vermont that are measured in the NAMP program (in 1994) had an average transparency of 14% and were considered to be in good condition overall. The stands on the Forest all fall in close range to this figure. Average dieback for NAMP plots in Vermont was 8%. Again, the stands on the Forest had similar figures.

Although the stands on the Forest are considered healthy in 1995, there should be continued monitoring of these areas. The drought conditions of this past year could impact these areas in the next few years. There were also no real biological stressors this year. One stand had been partially defoliated by bruce spanworm, but this insect should not be a major concern.

A real question that must be answered is the tradeoff between tapping and future timber considerations. Tapping causes defects that can degrade the timber value of trees in the future. There are some of these areas that really have no potential timber value in the maple that is present. In these areas, continued tapping at present levels is fine. Other areas do have potential crop trees. If timber production is a consideration in these areas, then the amount of tapping should be assessed. Both tapping and timber objectives can be met in a stand, but they will need to be balanced. Some trees can be tapped for sap production while others are left untapped for future timber considerations.